

WHAT IS CLAIMED IS:

1. A system for controlling variable positioning of compressor inlet guide vanes of a gas turbine engine comprising:

a) a normal mode schedule which schedules relatively closed inlet guide vane settings at low compressor speeds and relatively open inlet guide vane settings at high compressor speeds;

b) an alternate mode schedule which schedules inlet guide vane settings that are more closed at low compressor speeds than those scheduled by the normal mode schedule; and

c) means for rapidly moving the inlet guide vanes from the more closed settings of the alternate mode schedule to settings which are more open than those that are scheduled by the normal mode schedule during an acceleration from low engine power levels, and for commanding the inlet guide vanes back to the normal mode schedule as the acceleration nears completion.

2. A system as recited in Claim 1, further comprising means for invoking the alternate mode schedule for fast engine acceleration.

3. A method of controlling variable positioning of compressor inlet guide vanes of a gas turbine engine comprising the steps of:

a) providing a normal mode schedule which schedules relatively closed inlet guide vane settings at low compressor speeds and relatively open inlet guide vane settings at high compressor speeds;

b) providing an alternate mode schedule which schedules inlet guide vane settings that are more closed at low compressor speeds than those scheduled by the normal mode schedule;

5 c) rapidly moving the inlet guide vanes from the more closed settings of the alternate mode schedule to settings which are more open than those that are scheduled by the normal mode schedule during an acceleration from low engine power levels; and

d) commanding the inlet guide vanes back to the normal mode schedule as the acceleration nears completion.

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4. A method as recited in Claim 3, further comprising the step of invoking the alternate mode schedule for fast engine acceleration.

5. A system for controlling variable positioning of compressor inlet guide
15 vanes of a gas turbine engine based on optimized engine transient response comprising:

a) means for scheduling the inlet guide vanes to settings that are more closed than those that are scheduled in an optimum fuel burn schedule, during steady-state operating conditions and in anticipation of an engine acceleration, resulting in higher compressor speeds; and

20 b) means for providing anticipation in the control of the inlet guide vanes such that the inlet guide vanes are moved to positions that are more open than those that are scheduled in an optimum fuel burn schedule, during engine accelerations, resulting in a more rapid increase in engine output power.

6. A system as recited in Claim 5, further comprising means for commanding the inlet guide vanes back to the optimum fuel burn schedule as the engine acceleration nears completion.